Mathematical Literacy for College Students (MLCS)

Mathematics Student Learning Outcomes

ALGEBRAIC REASONING

ALGEBRAIC REASONING GOAL: Students will reason using the language and structure of algebra to investigate, represent, and solve problems.

Students will:

A. Understand various uses of variables to represent quantities or attributes.

For example: Students can identify variables as independent or dependent, See structure in expressions and manipulate simple expressions with procedural fluency, Write an expression to represent a quantity in a problem, Interpret an expression and its parts in terms of the quantity it represents.**;** Correctly use notation with variables (coefficients, exponents, subscripts) in simple and slightly complex expressions; Understand the difference between a variable and a constant; Use variable in context; Be able to use variables as placeholders as in formulas. Understand the meaning of variable, including formulas. Identify the nature of a variable from the context (place holder, unknown, property, etc).

B. Describe the effect that a change in the value of one variable has on the value(s) of other variables in the algebraic relationship.

For example: If the volume of a three-dimensional figure, like a rectangular solid, is held constant but the length is increased, what has to happen to either the width or height. Students can solve a problem like: Investigate the cost of a cell phone plan F+Mt as F, the fixed cost, or M the cost per minute changes. Investigate how the time required for an investment to reach a given amount changes as the APR changes.

C. Construct and use equations or inequalities to represent relationships involving one or more unknown or variable quantities to solve problems. Identify when there is insufficient information given to solve a problem.

For example: Student can solve linear inequalities in one variable and graph the solution set on a number line; Solve equations in one variable using manipulations guided by the rules of arithmetic and the properties of equality. Identify equivalent forms of a given equation or inequality and use its/their properties of equality to solve equations for a given quantity.

For example: Student can relate quantities relevant to the problem and possibly including quantities not explicitly identified in the problem statement.